

REMARKS

This is in full and timely response to the Final Office Action mailed on December 17, 2003. Reexamination in light of the following remarks is respectfully requested.

Claims 50-79 are currently pending in this application, with claims 50 and 79 being independent. No new matter has been added.

Rejection under 35 U.S.C. §102 and §103

Claims 50-64 were rejected under 35 U.S.C. §102 as being allegedly anticipated by U.S. Patent No. 6,434,297 to Althaus et al. (Althaus).

Claims 65-79 under 35 U.S.C. §103 as being allegedly obvious over Althaus in view of U.S. Patent No. 5,768,456 to Knapp et al. (Knapp).

These rejections are traversed at least for the following reasons.

Claim 50 and the claims dependent thereon are drawn to an optical coupling device comprising:

an optical lens array including a lens substrate made from an optical material and having a plurality of convex

portions extending therefrom, a convex portion of said plurality of convex portions having a convex shape and comprising a material the same as that of said lens substrate,

said lens substrate having a mask layer on the surface thereof, said mask layer comprising a material different than that of said lens substrate,

a height of said convex portion being specified on the basis of a thickness of said mask layer.

Claim 79 is drawn to an optical coupling device comprising:

a light outgoing member having an array of a plurality of light outgoing portions, a light outgoing portion of said a plurality of light outgoing portions emitting light;

a light incoming member having a plurality of light incoming portions, a light incoming portion of said a plurality of light incoming portions receiving said light, said light incoming portion corresponding to said light outgoing portion; and

an optical lens array including a lens substrate made from an optical material and having a plurality of convex portions extending therefrom, a convex portion of said plurality of convex portions having a convex shape and comprising a material the same as that of said lens substrate,

said lens substrate having a mask layer on the surface thereof, said mask layer having a plurality of mask layer portions and comprising a material different than that of said lens substrate, a mask layer portion of said plurality of mask layer portions has a curved surface, a location of said mask layer portion corresponding to a formation region of said convex portion,

said lens substrate being exposed between said mask layer portion and another of said plurality of mask layer portions,

a height and curvature of said convex portion being specified on the basis of a thickness of said mask layer.

Within the claims, a convex portion has a convex shape and comprises a material the same as that of the lens substrate, wherein a height of the convex portion is specified on the basis

of a thickness of the mask layer. Support for the claims is provided, at least, within figures 3A-3D and their associated disclosure within the specification as originally filed.

Althaus arguably teaches an optical system having a lens substrate 2 and a convex portion 7 (figures 1-2). Althaus arguably teaches a mask layer 13 (figure 3). Nevertheless, Althaus fails to disclose, teach or suggest the height of a convex portion 11 being specified on the basis of a thickness of the mask layer 13.

The Office Action contends that the overall height of the convex portion 11 of Althaus is dependent upon the height of mask layer 13 that has been patterned into diaphragms 4. The Office Action further contends that Althaus, read broadly, discloses the height of the convex portion being specified on the basis of a thickness of a mask layer. That is, the thickness of a mask layer contributes and determines the overall height of the resulting convex portion of the lens substrate (figure 3). The thicker the mask layer, the greater the height of the convex portion.

In response to these contentions, substrate 10 of Althaus is arguably a silicon semiconductor wafer (column 4, line 10) and mask layer 13 is arguably of a metal (column 4, line 24), whereas

the claimed invention provides that a convex portion comprises a material the same as that of the lens substrate. Thus the metal mask layer 13 of Althaus is separate and distinct from the convex portion 11.

Moreover, while Althaus arguably teaches a step of producing a plurality of convex projections 11 on a first main surface 12 of the silicon wafer 10 by means of a photographic technique and etching (column 4, lines 21-23), Althaus fails to disclose, teach or suggest the particular details of how the plurality of convex projections 11 are produced. While Althaus arguably teaches the steps of applying a metal layer 13 to the entire first main surface 12 (column 4, lines 24-25) and structuring the metal layer by means of a photographic technique and etching in such a manner that a diaphragm 4 remains on each convex projection 11 (column 4, lines 26-29), Althaus fails to disclose, teach or suggest a use of the metal layer 13 as an etch mask.

Figure 3 of Althaus depicts the formation of the convex portion 11 prior to the deposition of the mask layer 13 onto the convex portion 11. Mask layer 13 is formed after the formation of the convex portions 11. Althaus fails to disclose, teach or suggest the height of a convex portion 11 being specified on the basis of a thickness of the mask layer 13. There is no contribution made by the mask layer 13 of Althaus to the

formation of the convex portions 11. Thus, Althaus fails to disclose, teach or suggest the mask layer 13 as contributing to the formation of convex portions 11.

Knapp arguably teaches an optoelectronic package having convex portion 140 and lens substrate 142 (figure 4). However, Knapp fails to disclose, teach or suggest the height of the convex portion 142 being specified on the basis of a thickness of a mask layer.

Withdrawal of these rejections and allowance of the claims is respectfully requested.

Conclusion

For the foregoing reasons, all the claims now pending in the present application are allowable, and the present application is in condition for allowance. Accordingly, favorable reexamination and reconsideration of the application in light of the amendments and remarks is courteously solicited.

If the Examiner has any comments or suggestions that could place this application in even better form, the Examiner is requested to telephone Brian K. Dutton, Reg. No. 47,255, at 202-955-8753, or the undersigned attorney.

If any fee is required or any overpayment made, the Commissioner is hereby authorized to charge the fee or credit the overpayment to Deposit Account # 18-0013.

Respectfully submitted,

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